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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/806,002	06/15/2001	Kristian Glejbol	U013327-7	1312

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EXAMINER

MARKHAM, WESLEY D

ART UNIT	PAPER NUMBER
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1762

DATE MAILED: 10/31/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

cb8

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	09/806,002	GLEJBOL ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Wesley D Markham	1762	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☒ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All   b) ☐ Some \*   c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                          | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____  |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                 | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) Z. | 6) <input type="checkbox"/> Other:  |

**DETAILED ACTION**

***Response to Amendment***

1. Acknowledgement is made of applicant's preliminary amendment A, filed as paper #6 on 5/9/2001, in which Claims 4, 6 – 10, 13, 14, and 16 were amended, and Claims 17 – 20 were added. Claims 1 – 20 are currently pending in U.S. Application Serial No. 09/806,002 (which is a 371 (i.e., National Stage) Application of PCT/DK99/00523, filed on 10/4/1999), and an Office Action on the merits follows.

***Priority***

2. A copy of the certified copy of the priority document (i.e., Denmark PA 1998 01247, filed on 10/2/1998) has been received in this National Stage Application from the International Bureau pursuant to PCT Rule 17.2(a).

***Information Disclosure Statement***

3. Acknowledgement is made of the IDS filed by the applicant as paper #7 on 6/22/2001. The references listed thereon have been considered by the examiner as indicated on the attached copy of the PTO-1449 form. Additionally, please note that the international search report (ISR) corresponding to PCT/DK99/00523 and the references listed thereon have been considered by the examiner.

***Oath/Declaration***

4. The oath or declaration is defective. A new oath or declaration in compliance with 37 CFR 1.67(a) identifying this application by application number and filing date is required. See MPEP §§ 602.01 and 602.02. The oath or declaration is defective because it does not properly identify the foreign application for patent or inventor's certificate on which priority is claimed pursuant to 37 CFR 1.55, and any foreign application having a filing date before that of the application on which priority is claimed, by correctly specifying the application number, country, day, month and year of its filing. Specifically, the declaration correctly identifies Denmark PA 1998 01247 but incorrectly specifies the filing date as October 4, 1998. Denmark PA 1998 01247 was filed on October 2, 1998, not October 4, 1998.

***Specification***

5. Applicant is reminded of the proper language and format for an abstract of the disclosure. The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details. The language should be clear and concise and should not repeat information given in the

Art Unit: 1762

title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc. Further, the abstract is objected to because it appears to contain a typographical error. Specifically, it appears as though a comma (i.e., ",") is missing between the words "silver" and "palladium" on line 27 of the abstract.

6. The disclosure is objected to because of the following informalities:

- Pages 2 and 5: The specification contains what appear to be hand-written notations and/or amendments. The examiner is uncertain whether or not these hand-written notations are intended to be a part of the application. If the notations are intended to be a part of the application (i.e., as amendments), the examiner is uncertain when the notations were made because the notations are not initialed or dated. For the purposes of examination only, the examiner has treated the hand-written notations throughout the specification as not being part of the application. If the applicant wishes the notations to be formally entered into the application, the applicant is suggested to submit appropriate amendment(s) making the desired changes in response to this Office Action.
- The specification does not contain the section headings (i.e., "Background of the Invention", "Summary of the Invention", "Detailed Description of the Preferred Embodiments", etc.) conventionally utilized in U.S. practice.

- Page 2, line 34; page 8, line 5; and page 10, line 30: The word “polytetrafluoroethylene” is misspelled (i.e., as “poly-tetra-flour-ethylene” or “polytetrafluorethylene”).
- Page 3, line 28: The word “fluorine” appears to be misspelled “fluor”.
- Page 5, line 11: The word “triethylene” appears to be misspelled “triethylen”.
- Page 5, lines 12 and 15: The words “diacrylate” and “methacrylate” appear to be misspelled “diacrylat” and “methacrylat”, respectively.
- Page 5, line 24: A comma appears to be missing between the words “silver” and “palladium”.
- Page 6, lines 4 – 5: The phrase, “step d) may follow step c) or start simultaneously with step d)” appears to contain a typographical error. Specifically, it appears as though the aforementioned phrase should read, “step d) may follow step c) or start simultaneously with step c)”.
- Page 6, lines 24 – 25; page 7, lines 15, 19, and 27; page 8, lines 1 and 21; and page 9, line 6: Since the claim numbering in an application is subject to change throughout the prosecution of the application, it is improper to refer to claims by specific claim numbers (e.g., “claim 14”) in the body of the specification.
- Page 11, lines 14 – 15; page 12, lines 15 and 28: The use of the trademark SHIPLEY CUPOSIT 251 ELECTROLESS COPPER has been noted in this application. It should be capitalized wherever it appears and be accompanied by the generic terminology. Although the use of trademarks is permissible in

Art Unit: 1762

patent applications, the proprietary nature of the marks should be respected and every effort made to prevent their use in any manner that might adversely affect their validity as trademarks.

- The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Specifically, the specification does not provide proper antecedent basis for the following claimed subject matter: (1) The specific monomer / monomer vapor compositions recited in Claims 4 and 5, (2) the use of a gas plasma generated by audio frequency (AF) excitation, as recited in Claim 8, and (3) a monomer pressure of between 0.1 and 100,000 Pa, as recited in Claim 9.

Appropriate correction is required.

### ***Claim Objections***

7. Claims 1 – 3, 6, 8, and 15 are objected to because of the following informalities:

- Claims 1 and 2: These claims contain what appear to be hand-written notations and/or amendments. The examiner is uncertain whether or not these hand-written notations are intended to be a part of the application. If the notations are intended to be a part of the application (i.e., as amendments), the examiner is uncertain when the notations were made because the notations are not initialed or dated. For the purposes of examination only, the examiner has treated the hand-written notations in Claims 1 and 2 as not

being part of the claims. If the applicant wishes the notations to be formally entered into the application, the applicant is suggested to submit appropriate amendment(s) making the desired changes in response to this Office Action.

- Claim 1, line 12: The word "triethylene" appears to be misspelled "triethylen".
- Claim 1, line 24: It appears as though a comma is missing between the words "silver" and "palladium".
- Claim 3, line 3: The word "methacrylate" appears to be misspelled "metacrylate".
- Claim 6, line 5: The word "polytetrafluoroethylene" appears to be misspelled "polytetrafluorethylene".
- Claim 8, line 2: The word "by" appears to be misspelled "b)".
- Claim 15, lines 8 – 9: The phrase, "where step d) follows step c) or starts simultaneously with step d)" appears to contain a typographical error. Specifically, it appears as though the aforementioned phrase should read, "where step d) follows step c) or starts simultaneously with step c)".

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

8. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.



Art Unit: 1762

9. Claims 1 – 20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
10. The term "short" in Claim 1 (from which Claims 2 – 20 depend) is a relative term that renders the claims indefinite. The term "short" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. Specifically, independent Claim 1 requires a "short surface deposition" of metal atoms. After reviewing the specification as a whole, the examiner notes that no explicit or implicit definition of the limitation "short surface deposition" is provided, and the aforementioned limitation does not appear to have an art-recognized meaning. As such, one skilled in the art would not be reasonably apprised of the scope of the applicant's claims, and the claims are indefinite under 35 U.S.C. 112, second paragraph.
11. Claim 2 recites the limitation "the catalytic metal" in lines 1 – 2 of the claim. There is insufficient antecedent basis for this limitation in the claim. Specifically, it is unclear whether "the catalytic metal" recited in Claim 2 refers to (1) the metal deposited by the PVD or CVD process recited in step (c) of Claim 1, (2) a metal deposited by the electroless bath in step (d) of Claim 1, and/or (3) a metal deposited by electrolytic metallization in step (d) of Claim 1. Therefore, the scope of Claim 2 is vague and indefinite. For the purposes of examination only, the examiner has interpreted "the catalytic metal" of Claim 2 to be equivalent to the metal deposited by PVD or CVD in

Art Unit: 1762

step (c) of Claim 1. Additionally, Claim 2 recites that the catalytic metal comprises Pt, Ag, Pd, Cu, and Au. This limitation renders the claim indefinite because it is unclear whether the catalytic metal (1) must contain all of the elements Pt, Ag, Pd, Cu, and Au (e.g., as a five element alloy), or (2) must comprise at least one of the elements Pt, Ag, Pd, Cu, and Au. As such, the scope of Claim 2 is vague and indefinite. For the purposes of examination only, the examiner has interpreted Claim 2 to require that the metal comprise at least one of the elements Pt, Ag, Pd, Cu, and Au in order to give the claim its broadest reasonable interpretation.

12. Regarding Claim 6, the phrase "type" renders the claim(s) indefinite because the claim(s) include(s) elements not actually disclosed (those encompassed by "type"), thereby rendering the scope of the claim(s) unascertainable. Specifically, it is unclear what polymers are encompassed by the limitations "polyolefine type", "aryl type", "diene type", "silicone type", and/or "fluorine type", and therefore one skilled in the art would not be reasonably apprised of the scope of Claim 6.
13. Claim 7 recites that the polymer substrate be "PTFE PP". It is unclear what polymer the applicant intends to refer to by reciting "PTFE PP", and therefore the scope of Claim 7 is vague and indefinite. For the purposes of examination only, the examiner has reasonably interpreted Claim 7 to require that the polymer substrate be either PTFE (i.e., polytetrafluoroethylene) or PP (i.e., polypropylene).
14. Claim 11 recites that "step b) is started 10 to 30 seconds after step a)". This limitation renders Claim 11 vague and indefinite because it is unclear whether (1)

step b) is started 10 to 30 seconds after step a) is started, or (2) step b) is started 10 to 30 seconds after step a) is completed. As such, the scope of Claim 11 is unclear.

### ***Claim Observations***

15. Please note that the claims of the instant application use various terms such as, "such as", "optionally", "preferably", "most preferably", and "more preferably". For the purposes of examination, the examiner has interpreted the limitations associated with the aforementioned terms to be exemplary and descriptive (i.e., optional), not required.

### ***Claim Rejections - 35 USC § 102***

16. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

17. Claims 1 – 4, 6 – 8, 14, 16, 19 and 20 are rejected under 35 U.S.C. 102(e) as being anticipated by Yializis (USPN 6,214,422 B1).

18. Regarding independent Claim 1 (from which Claims 2 – 20 depend), Yializis teaches a method of metallizing a solid polymer substrate (Abstract), the method comprising

the steps of subjecting the substrate surface to a gas plasma (Abstract, Col.2, lines 18 – 44, Col.4, lines 60 – 65, and Col.5, lines 3 – 5), forming a layer on the surface using a plasma enhanced polymerization process employing one or more monomers comprising monomers selected from the group of monomers listed by the applicant in step b) of the claim (Abstract, Col.2, lines 22 – 27, Col.4, lines 18 – 44 and 65 – 67, Col.5, lines 1 – 2 and 20 – 30, Col.6, lines 62 – 67, Col.7, lines 1 – 8 and 58 – 67, Col.8, and Col.10, lines 62 – 67), and providing a surface deposition using a PVD or CVD process to deposit metal atoms such as copper, tin, silver, palladium, platinum, or gold (Abstract, Col.2, lines 44 – 50, Col.5, lines 56 – 67, Col.6, lines 7 – 12, and Col.7, lines 9 – 19). Yializis does not explicitly teach that the step of subjecting the substrate surface to a gas plasma generates radicals on the substrate surface. However, the substrate taught by Yializis (e.g., polypropylene (PP)) is the same as a substrate claimed and disclosed by the applicant (Col.2, lines 29 – 31), and the gas used in the plasma of Yializis (i.e., argon) is the same as the gas disclosed by the applicant (Col.2, lines 39 – 41). Therefore, the plasma treatment of the substrate surface of Yializis would have inherently generated radicals on the substrate surface, as claimed by the applicant. Additionally, Yializis does not explicitly teach that the metal PVD or CVD step is a “short surface deposition” step. However, the film of Yializis is generally formed at a “high speed” (Abstract), for example at a drum rotation speed of 1 to 1000 cm/second (Col.5, lines 10 – 11), and the deposited metal film has a small thickness such as 100 Angstroms (10 nm) (Col.7, lines 9 – 19). Depositing a metal film at a high speed to a small thickness, as

taught by Yializis, constitutes a "short surface deposition" step, as claimed by the applicant. Further, Yializis does not explicitly teach an electroless or electrolytic metallization step as recited in step d) of Claim 1. However, such a step is optional in the applicant's claim (see step d) of Claim 1) and is therefore not required.

19. Yializis also teaches all the limitations of Claims 2 – 4, 6 – 8, 14, 16, 19 and 20 as set forth above in paragraph 18 and below, including a method wherein / further comprising:

- Claim 2: The PVD or CVD deposited metal comprises at least one of Pt, Ag, Pd, Cu, and Au (Col.2, line 48, and Col.7, line 12).
- Claim 3: The monomer or monomer mixture comprises one or more of cyanoacrylate and glycidyl methacrylate, preferably 2,3-epoxypropylmethacrylate (Col.7, line 3, and Col.8, lines 18 – 19).
- Claim 4: Step b) comprises treatment of the surface with a monomer vapour comprising 0.5 to 90 mole % of 2-ethylcyanoacrylate vapour (Col.5, lines 20 – 30, and Col.8, lines 18 – 19).
- Claims 6 and 7: The polymer substrate is a polyolefine type, such as PE or PP, an aryl type, such as styrene, a diene type, such as polybutadiene, polyisoprene, a silicone type, or a fluorine type, such as PTFE, or its copolymers (Claim 6), specifically PTFE or PP (Claim 7) (Col.2, lines 29 – 36, Col.4, lines 19 – 25, and Col.5, lines 12 – 20).
- Claim 8: The gas plasma is generated by excitation of the gas in a DC, LF, AF, RF, or microwave generated electric field (Col.5, lines 3 – 5).

- Claims 14, 19, and 20: The total pressure under step a) (i.e., the plasma treatment step) is equal to the total pressure under step b) (i.e., the plasma polymerization step) and between 0.2 and 100,000 Pa (Claim 14), particularly between 0.2 and 10,000 Pa (Claim 19), more particularly between 10 and 1000 Pa (Claim 20). Specifically, Yializis teaches that the hybrid film (i.e., the film produced by the plasma treatment / plasma polymerization / metallization processes) is produced in-line, in the same vacuum chamber (Abstract, and Figure 1 and its associated description). Therefore, the total pressure (i.e., the chamber pressure) is the same as each of the process steps is performed. Yializis teaches that this pressure is "less than about 1 millibar" (Col.4, lines 51 – 54), which is equivalent to "less than about 100 Pa". This range of pressures falls within the applicant's claimed range.
- Claim 16: A polymer substrate metallized according to the method of Claim 1 (see the discussion of Claim 1 in paragraph 18 above).

### ***Claim Rejections - 35 USC § 103***

20. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

21. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the

Art Unit: 1762

various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

22. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yializis (USPN 6,214,422 B1) in view of either Wenz et al. (USPN 5,312,864) or Hechenberger et al. (USPN 4,997,861).

23. Yializis teaches all the limitations of Claim 5 as set forth above in paragraphs 18 – 19, except for a method wherein the monomer prior to vaporization consists essentially of (1) 2-ethylcyanoacrylate, (2) an acid having a partial vapor pressure in the plasma which is lower than the partial vapor pressure of 2-ethylcyanoacrylate, and (3) up to 40 weight percent of another filler. However, the monomer of Yializis is, prior to vaporization, in liquid form (Col.5, lines 20 – 30) and can be 2-ethylcyanoacrylate (Col.7, line 3, and Col.8, lines 18 – 19). Wenz et al. teaches that it was known in the art at the time of the applicant's invention to include a polymerization inhibitor such as a sulfonic acid or a phosphoric acid in a 2-ethylcyanoacrylate composition in order to stabilize it in storage (Col.5, lines 8 – 20, and Col.7, lines 64 – 65). The amount of stabilizer added is from 1 to 1,000 ppm, based on the total weight of the composition (Col.5, line 17). Hechenberger et al.

Art Unit: 1762

teaches that it was known in the art at the time of the applicant's invention to include an acidic stabilizer such as phosphoric acid in a cyanoacrylate composition in order to stabilize against polymerization of the cyanoacrylate (Col.1, lines 7 – 10, and Col.2, lines 44 – 58). The amount of stabilizer added is from 100 to 500 ppm (Col.2, lines 40 – 43). Therefore, it would have been obvious to one of ordinary skill in the art to add a small amount (e.g., 1 to 1,000 ppm or 100 to 500 ppm) of acidic stabilizer such as phosphoric acid to the 2-ethylcyanoacrylate monomer liquid of Yializis prior to vaporization with the reasonable expectation of successfully and advantageously stabilizing the composition against polymerization during storage. By utilizing such a small amount of acidic stabilizer, as taught by either Wenz et al. or Hechenberger et al., the acid would necessarily have a partial vapor pressure (i.e., concentration) in the plasma which is lower than the partial vapor pressure of 2-ethylcyanoacrylate.

24. Claims 9 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yializis (USPN 6,214,422 B1) in view of Yializis et al. (USPN 4,842,893).

25. Yializis teaches all the limitations of Claims 9 and 17 as set forth above in paragraphs 18 – 19, except for a method wherein the monomer pressure in step b) is between 0.1 and 100,000 Pa (Claim 9), particularly between 0.2 and 10,000 Pa (Claim 17). Specifically, Yializis is silent as to the monomer pressure. However, Yializis does point to USPN 4,842,893 (i.e., Yializis et al.) as teaching the basic aspects of the vacuum polymerization process (Col.4, lines 26 – 30). Yializis et al.



Art Unit: 1762

teaches that, in the vacuum polymerization process analogous to that taught by Yializis, the acrylate monomers should have a high vapor pressure of up to 0.1 Torr (i.e., 13.3 Pa) (Col.2, lines 41 – 52). This monomer pressure is within the applicant's claimed pressure range. It would have been obvious to one of ordinary skill in the art to utilize a monomer pressure in the range claimed by the applicant (and taught by Yializis et al.) in the polymerization process step of Yializis because Yializis is silent as to the monomer pressure and points to USPN 4,842,893 (i.e., Yializis et al.) as teaching the basic aspects of the vacuum polymerization process, and Yializis et al. teaches that monomer pressures in the range claimed by the applicant are operable.

26. Claims 10 – 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yializis (USPN 6,214,422 B1) in view of Yializis et al. (USPN 4,842,893) and either Polak (USPN 4,382,101) or Hodgkin et al. (WO 97/31034 A1).

27. Yializis teaches all the limitations of Claims 10 – 12 as set forth above in paragraphs 18 – 19, except for a method wherein the generation step a) (i.e., the plasma treatment step) is carried out for a period of between 0.01 and 1,000 seconds, and the step b) (i.e., the plasma polymerization / monomer deposition step) is carried out for a period of between 0.1 and 1,000 seconds (Claim 10), particularly wherein step a) is carried out for more than 30 seconds, and step b) is started 10 to 30 seconds after step a) (Claim 11), particularly wherein step a) is carried out for a period of between 10 and 60 seconds and step b) is carried out for a period of between 10 and 200 seconds (Claim 12). Specifically, Yializis is silent as to the duration of steps

a) and b), as well as the time between steps a) and b). However, Yializis does point to USPN 4,842,893 (i.e., Yializis et al.) as teaching the basic aspects of the vacuum polymerization process (Col.4, lines 26 – 30) and state that the thickness of the polymer film (i.e., the film deposited by the plasma polymerization process) depends on the particular application (Col.6, lines 34 – 38). Yializis et al. teaches that, in a vacuum polymerization process analogous to that taught by Yializis, the thickness of the coating is dependent upon the time of deposit (Col.6, lines 39 – 40). In other words, Yializis et al. teaches that the deposition time is a result / effective variable that determines the thickness of the film. It would have been obvious to one of ordinary skill in the art to optimize the polymer deposition time (i.e., step b)) in the process of Yializis as a result / effective variable through routine experimentation, including to a value in the range claimed by the applicant, in order to achieve the specific film thickness desired by the purveyor in the art. The exact deposition time would depend on the exact film thickness desired. Additionally, Polak teaches that plasma pretreatment times of from about 0.1 minute to about 4 hours are utilized to pretreat a polymeric substrate prior to the deposition of a subsequent layer in order to increase the peel-strength between the layers (Col.1, lines 60 – 68, and Col.2, lines 1 – 6). The exact treatment time depends on the operating conditions, such as temperature, pressure, power, etc. and should be sufficient to treat the surface of the polymer until the surface is more susceptible to bonding with the subsequently deposited layer (Col.3, lines 11 – 19). Hodgkin et al. teaches that a plasma pretreatment time of about 60 seconds is sufficient to clean the surface of a

polymeric material prior to depositing a polymeric coating by plasma polymerization thereon (page 1, lines 30 – 32, page 2, lines 1 – 2 and 13 – 20, and page 5, line 11). It would have been obvious to one of ordinary skill in the art to utilize a plasma pretreatment time (i.e., step a)) in the range claimed by the applicant (and taught by Polak and Hodgkin et al.) with the reasonable expectation of successfully and advantageously preparing the polymeric substrate surface of Yializis for subsequent deposition steps by using a plasma pretreatment process for a period of time known in the art to be sufficient to prepare (i.e., clean and improve the adhesion of) the aforementioned substrate. The exact plasma treatment time would depend on the operating conditions, such as temperature, pressure, power, etc., and would be determined by one of ordinary skill in the art. Regarding the limitation in Claim 11 that step b) is started 10 to 30 seconds after step a), the combination of Yializis, Yializis et al., and either Polak or Hodgkin et al. does not explicitly teach this limitation. However, in the process of Yializis, the period of time between step a) (i.e., the plasma treatment step) and step b) (i.e., the forming a layer / plasma polymerization step) would be determined by the drum rotation speed (i.e., the faster the drum rotates, the shorter the period of time between steps a) and b)). Yializis teaches a wide range of drum rotation speeds (Col.5, lines 10 – 11), and the drum rotation speed would also be expected to determine the length of time spent at each process station and thus the thickness of the layer deposited at each station. Since it would have been obvious to one of ordinary skill in the art to optimize the length of time spent at each station in the process of Yializis (see the discussion in this

Art Unit: 1762

paragraph above), it would also have been obvious to one of ordinary skill in the art to optimize the drum speed (and therefore the period of time between steps a) and b)) through routine experimentation in order to achieve the desired plasma treatment time and coating layer thickness values.

28. Claims 13 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yializis (USPN 6,214,422 B1).

29. Yializis teaches all the limitations of Claims 13 and 18 as set forth above in paragraphs 18 – 19, except for a method wherein the temperature is the same under both step a) and step b) (Claim 13), particularly between 280 and 330 K (Claim 18). However, the entire process of Yializis, including the applicant's claimed steps a) and b), is performed in-line, in the same vacuum chamber (Abstract). Additionally, Yializis does not mention that the chamber atmosphere is heated in any way, and the drum within the chamber of Yializis can be kept at "room temperature" (i.e., about 25° C, which is equivalent to about 298 K, a value within the applicant's claimed range) (Col.10, lines 25 – 34). Therefore, it would have been obvious to one of ordinary skill in the art to perform the entire process of Yializis at room temperature (i.e., 298 K) with the reasonable expectation of (1) success, as Yializis does not mention that the chamber atmosphere is heated in any way, and the drum within the chamber of Yializis can be kept at "room temperature", and (2) obtaining the benefits of performing the entire process at room temperature, such as reducing the complexity of the process in comparison to a process that requires different

temperatures for different process steps, and reducing energy costs by eliminating the need to heat and/or cool various elements of or in the process chamber.

30. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yializis (USPN 6,214,422 B1).in view of Swisher (USPN 5,112,462).

31. Yializis teaches all the limitations of Claim 15 as set forth above in paragraphs 18 – 19, except for a method wherein step d) (i.e., the electroless or electrolytic metallization step) follows step c) (i.e., the PVD or CVD metallization step) or starts simultaneously with step c). Please note that Yializis does teach that step b) follows immediately after step a), and step c) follows immediately after step b), as required by Claim 15 (see Figure 1 and the discussion in Yializis on Col.4, lines 32 – 67, and Col.5, lines 1 – 62). Yializis is silent as to any electroless or electrolytic metallization step. However, Yializis does teach that the polymer / metal hybrid film can be utilized in food packaging applications, electric applications, and decorative wraps (Col.1, lines 13 – 21). Swisher teaches that polymer / metallic laminates used in packaging, printed wiring films, and decorative layers (i.e., applications analogous to those taught by Yializis) are conventionally produced by vacuum metallizing the polymeric film to a small thickness and then either electroplating or electroless plating a subsequent metal layer in order to increase the thickness of the metal layer (Col.1, lines 6 – 14, Col.4, lines 6 – 17, Col.5, lines 54 – 65, and Col.10, lines 20 – 61). Therefore, it would have been obvious to one of ordinary skill in the art to either metallize the surface of Yializis with a conventional electroless bath or by using

Art Unit: 1762

direct electrolytic metallization (i.e., electroplating) following the PVD or CVD metallization step of Yializis (i.e., to perform step d) after step c)) with the reasonable expectation of successfully and advantageously increasing the thickness of the metallic layer by conventionally known means in order to form packaging and decorative laminates having a relatively thick metallic layer, as taught by Swisher.

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Nakayama et al. (USPN 4,780,354) teaches a method of manufacturing a magnetic recording medium comprising plasma treating a substrate, plasma polymerizing a coating on the plasma treated substrate, and depositing a thin metallic layer on the plasma polymerized coating. Yokura et al. (JP 01-171856 A) teaches depositing a plasma polymerized glycidyl methacrylate coating on a polymeric substrate prior to vapor depositing a metal layer in order to achieve a high bonding strength between the layers.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Wesley D Markham whose telephone number is (703) 308-7557. The examiner can normally be reached on Monday - Friday, 8:00 AM to 4:30 PM.

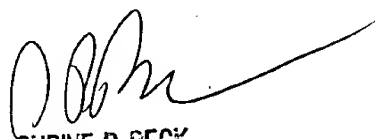
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shrive Beck can be reached on (703) 308-2333. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Art Unit: 1762

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Wesley D Markham  
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Art Unit 1762

  
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